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The Political Economy of Renewable Energy Policies in Germany and the EU

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Abstract

In this paper, we employ a public choice perspective to analyze the development of policies for renewable energy sources (RES) in the EU in general and in Germany more specifically. In doing so, we explain the main characteristics of current RES policies in the EU by reference to the self-interest driven motivations of voters, stakeholders and political actors. One important puzzle, which we address, is the following: How could effective RES-policies be introduced against the political opposition of fossil-fuel interest groups in the past? Via analyzing the German example in more detail, we show how over time a self-reinforcing interplay of ideological and financial RES support has emerged. Moreover, we demonstrate that observed specific design choices for EU RES policies, such as largely riskless remuneration schemes, high degrees of technology differentiation and decentralized decision-making across Member States, can be traced back to politicians' need to balance a variety of partly opposing interests. A major benefit of the presented analysis is that it provides a realistic assessment of the challenges for RES policy reform – any reform effort critically depends on its ability to balance stakeholder interests.

Keywords: lobbying, public choice, renewable energy sources, subsidies, support policies

JEL Classification: D 72, D 78, H 25, K 32, Q 42

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1. Introduction

Policies supporting renewable energy sources (RES) have become a cornerstone of climate and energy policy in the EU. All EU Member States have introduced some form of RES support or a mix of support policies. Apparently, these policies are very effective: In the EU, the share of RES in electricity consumption has increased from 14.3% in 2004 to 25.4% in 2013[1] and in Germany from 9.3% to 25.4% (BDEW 2015) within the same time. This development is somewhat surprising, given that the EU's (and more generally developed countries') environmental policies have been scolded as "merely symbolic" and broadly ineffective (Blühdorn 2007). Moreover, RES policies have been continuously facing critique from academia as well as industry stakeholders. Some economists have repeatedly argued that RES policies (allegedly) reduce the cost-effectiveness of climate policy; in consequence, they call for RES instruments to be scrapped and EU climate policy to exclusively rely on the EU emissions trading scheme (e.g., Stavins 2014, Weimann 2009). From an industry perspective, conventional utilities, the direct competitors of newly emerging RES producers, have tried to undermine the cause of RES by both provoking numerous court proceedings (e.g. against the German RES Act) and by exerting influence on the general public, for instance by placing ads claiming that RES cannot significantly contribute to secure electricity supply (e.g., German utilities 1993). Recently, with the energy transition growing in popularity (even occupying the political mainstream in Germany, cf. Strunz 2014), and RES affecting electricity markets to the point of questioning the conventional utilities' business models (Steitz and Käckenhoff 2015), critiques are more specifically directed at the set-up of RES policies. For instance, the association of European industries and employers takes aim at priority grid access for RES and demands that RES be made "responsible for imbalance costs" (Businesseurope 2013: 14). Thus, the first puzzle is how policy support for RES has become politically feasible and continues to effectively transform electricity markets despite the incumbent competitors' organized opposition.

The second puzzle concerns the fragmentation of RES policies in the EU: while there is evidence that EU-level cooperation would increase the cost-effectiveness of RES-deployment (e.g., Unteutsch and Lindenberger 2014; but see also Gawel et al. 2014b) and even though a common EU RES-target architecture exists, the actual support policies remain decentralized on the level of EU Member States and cooperation among the latter is scarce (Klinge Jacobsen et al. 2014). Furthermore, regional and communal activities drive the bottom-up deployment of RES, adding to

[1] http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdcc330&plugin=1

the picture of overall fragmentation. Thirdly, as regards the technical details of policies, policy makers must select among a variety of design options (quota scheme or feed-in tariff, support level, degree of technology differentiation, finance mechanism, etc.). Again, the actual pattern of strongly differentiated policies varies significantly from often recommended market-based, technology-neutral instruments (e.g., Monopolkommission 2013). Thus, a satisfying theory would explain why particular options have been preferred over others and why the most relevant decisions are made on (sub-) national level despite the fact that the establishment of a common market for, amongst other goods, energy with uniform market conditions, is one of the core objectives of the EU project.

In order to shed some light on these puzzles, the paper addresses three specific sets of questions, related to 1) the very existence of RES support, 2) the organization/distribution of responsibilities for policy making across political levels and 3) the specific policy design:

1) Why have ambitious targets for RES deployment become politically palatable? How could effective RES policies have been implemented against the opposition of conventional utilities and their interest groups?
2) Why are RES policies still fragmented – both between EU Member States but also within Member States?
3) Why have the specific patterns of national RES policy design emerged?

We adopt the approach of public choice to analyze these questions. The public choice approach assumes that the self-interest of actors involved in the political process (voters, politicians, bureaucrats and interest groups) drives the actual design of policies (seminal Tullock 1967, see Kirchgässner and Schneider 2003 for an introduction). This perspective leads to a "politics without romance" (Buchanan 1984) view that does not expect policy outcomes to be welfare-maximizing. Rather, politicians act as brokers (McCormick and Tollison 1981), balancing different stakeholder interests so as to maximize their own special interest, which consists mainly in getting (re-)elected. Likewise, bureaucrats may tend to maximize budgets and influence (Niskanen 1971). The advantage of this approach lies in providing a realistic basis for policy advice whereas more idealistic conceptions place high hopes on politicians, who are expected to implement "rational policies against special interests" (Weimann 2009: 222, own translation). But then, why should politicians act less according to their self-interest than other citizens?

The literature provides already some analyses of RES policies from a public choice perspective. Jenner et al. (2012)'s econometric analysis of the EU-27 identifies several factors that makes the introduction of RES support more likely: the existence of solar energy associations, a high unemployment rate and relatively low concentration of electricity markets. Vossler (2014) investigates the development of Germany's RES Act – the law that formalizes the support for RES – and discusses the prospects of further reforms. Müller (2015) provides an analytical model of interest-group competition between RES and conventional energy producers. Gawel et al. (2014a) analyze the interaction between EU emissions trading scheme and RES support policies; they find that, in principle, the latter could work to the benefit of a stronger EU emissions trading scheme

via lowering the emitting industries' bargaining power. While these existing studies focus on specific aspects of RES policies, such as certain stages of development and stakeholder involvement, we aim to provide a more comprehensive public choice discussion. In particular, our analysis includes all relevant levels of political decision-making (EU, national, subnational). Moreover, we do not only try to understand the introduction of RES policies, but also observed patterns of fragmented responsibilities and specific design choices under repeated policy reforms. Hence, we shed light on the relevance and dynamic evolution of political interests throughout the entire policy cycle of RES support schemes. For this purpose, our paper brings together evidence from a variety of existing theoretical and empirical analyses.

While the paper generally deals with the EU as a whole, it partly focuses on the particular case of Germany for two reasons: First, this focus allows us to provide a less abstract and therefore more accessible storyline. Second, and this is the main reason, Germany's support scheme for RES has proven to be a forerunner and model for other EU Member States (cf. Jacobsson and Lauber 2006, Lipp 2007) and its long-term energy transition goals are very ambitious. At the same time, Germany's highly industrialized economy is the largest in Europe and the politico-economic foundations of the German transition process - which has already been called a "gamble" (Buchan 2012) – are worldwide of general interest.

As a result of this paper's analysis, the emergence of the current framework of RES support in Germany and the EU will be clearer – for instance the reliance on highly differentiated support schemes enables policy makers to satisfy a broad range of interests. Even more importantly, the analysis also provides important insights for future reforms to RES policies, which may be required, for example, to improve market and system integration of RES power generation. In fact, we show that the success of reform efforts critically depends on the reforms' ability to cater to the demands of concerned special interests; that is, any successful reform needs sufficient public support for the unavoidable redistribution of RES-related rents. The danger, therefore, is that RES policies become locked into inefficient paths, and that envisaged policy adjustments fail to materialize. In order to avoid such a scenario, reform discussions should duly account for the distributional and thus political aspects of aspired reforms.

The rest of this paper is structured as follows: in Section 2, we set out the theoretical public choice framework in more detail. Section 3 is devoted to the main analysis of RES policies and their specific configurations. In Section 4 we discuss these findings and draw conclusions.

2. Theoretical Framework

The public choice perspective is based on the assumption that political decisions are predominantly determined by the self-interest of voters, interest groups as well as politicians and bureaucrats on different levels of government.

First, voters cast their ballot in order to maximize their expected personal gains (Downs 1957). In their double role as electricity consumers, they aim at receiving secure supply at a minimum of costs – both in terms of financial costs (electricity prices, RES surcharges) and externalities from electricity production (e.g., air pollution from coal plants, NIMBY problems from wind farms and transmission lines).

Second, various interest groups compete in their lobbying efforts to extract rents by steering regulation in their favor (Stigler 1971, Tullock 1967). In the electricity sector, incumbent conventional industries try to defend their position against new RES producers. Traditionally, environmental concerns of voters and environmental interest groups have been considered less powerful than conventional industry interests (Olson 1971, Kirchgässner and Schneider 2003).

Third, politicians act as transfer brokers, redistributing welfare between different stakeholders so as to secure public support and maximize their chances of electoral success (McCormick and Tollison 1981). On the one hand, politicians may aim to influence electoral outcomes directly by addressing the interests of the median voter (Downs 1957). On the other hand, they may also strive to satisfy interest groups which may indirectly affect electoral success by launching (or not) public campaigns. Moreover, the revolving-door phenomenon of elected representatives turning into lobbyists (and vice versa) shows that politicians' self-interest goes beyond the next elections in the sense that they may derive long-term benefits from cooperating with industry lobbyists in their legislative roles (see Dal Bó (2006) for a review on means of "regulatory capture"). For instance, it has been empirically demonstrated that in the US "ex-government officials extract monetary rents in terms of generating revenue from their personal connections to elected representatives" (Blanes i Vidal et al. 2012: 3740).

Fourth, bureaucracy constitutes an important element within the process of policy formation and implementation (Niskanen 1971): administrative officials aim at maximizing their discretionary power and their departments' budgets. This concerns all levels of government. For instance, the EU commission seeks to centralize decision making power on the EU level; national ministries benefit from complex policies that require more resources to be implemented than simple policies; regional administrations oppose uniform policies (on EU or national level) and aim for regional specifications at their discretion.

In sum, one might speak of a layered system of political markets (cf. Keohane et al. 1998), where politicians try to balance supply of and demand for regulation. The best organized interests succeed in framing the demand for regulation. Catering to the relative strength of these interests by transferring rents from less to better organized stakeholders is assumed to be the politicians' main tool for clearing the political market (McCormick and Tollison 1981). This perspective does not exclude ideological motivations – as the analysis below demonstrates, they are indeed a necessary component of a satisfying explanation of RES policies. Early on, public choice theory acknowledged the influence of politicians' own ideological motivations on the supply of regulation (Peltzman 1976). Thus, a comprehensive theoretical framework relies on the interplay of interests, ideas and institutions (cf. May and Jochim 2013). The crucial point here is that interest-

based and ideologically motivated behavior are not mutually exclusive categories of action. Rather, they are constantly interacting, leaving an institutional imprint, which, in turn, feeds back into motives and interests. Furthermore, some specific argument may be both interest-based and ideologically motivated: in particular, rent-seeking might be framed (cynically: disguised) as promoting the public interest.

Let us apply this framework to the case of RES policies. The presumption is that RES policies are not only a matter of ideology, but also a source of material costs and benefits. While environmental values importantly contributed to the introduction and fostering of RES policies, the public choice perspective also emphasizes the rents generated by RES policies. Similar (and partly identical) to the "carbon pork barrel" created through climate change mitigation policies (Helm 2010), active support for RES adds a further possibility to distribute rents within the energy sector. The latter is often characterized by high financial turnover and cosy relations between the state and the corporate world. In Germany, for instance, the remunerations for electricity from RES amounted to about 25 billion Euro in 2014 (BMWi 2014) and the energy sector exhibits a long corporatist tradition (Radkau 2008).

Accordingly, all concerned stakeholders can be expected to seek these rents: RES producers aim for generous subventions; conventional utilities try to either stop RES deployment or redirect subventions in their favor; voters would like to become *prosumers*, by producing RES-generated electricity on their rooftops or in their yards so as to receive RES subventions; furthermore, consumers seek to minimize their electricity bill by preventing RES surcharges on electricity prices; politicians need to broker all these interests by balancing or redistributing welfare between all stakeholders in a way that helps them win elections and maintain public support; moreover, politicians and administrative officials on all levels of government aim at concentrating decision making power at their discretion.

In the following, we analyze in detail how ideological motivations and material interests interacted in establishing and fostering RES policies in the EU and in Germany more particular.

3. RES Policies in Germany and the EU

3.1 How could effective RES policies be implemented?

Initial hurdles

That RES policies have become widespread in the EU (as outlined above, the following discussion partly focuses on Germany to provide more illustrating details) seems puzzling: after all, the opposition of well-organized interest groups from the conventional electricity producers can be considered substantial. In Germany, conventional utilities have for several decades been benefitting from various subsidies such as nuclear research grants and support policies for coal mining that amount to a fictitious "fossil-nuclear" premium of up to 10 € cent per kWh (cf. Küchler and

Meyer 2012). The conventional utilities effectively split up the electricity market among themselves via vertically integrated regional monopolies (i.e., both production and transmission infrastructure). The EU electricity market liberalization in the 1990s brought unbundling of production and grids but also enabled market stabilization via company mergers: in 2007, a national oligopoly (the "big four") still accounted for 85% of electricity production in Germany (Monopolkommission 2013: 72).

This economic dominance involved considerable political leverage. The regular and personal maintenance of contacts between lobbyists and politicians is regarded as the most successful lobbying strategy in the energy sector (Sühlsen and Hisschemöller 2014) – and such particularly close ties between utilities and decision makers are widely acknowledged (cf. Radkau 2008). This also includes revolving door phenomena: for instance, Werner Müller served as a Minister for Economics and Technology under the first Cabinet of Chancellor Gerhard Schröder (1998-2002), while holding high-level jobs in the electricity industry beforehand and afterwards. In general, the "big four" disposed of implicit "blackmailing potential" in that they suggested negative consequences for employment and security of supply in case their dominant position might be in danger.

Furthermore, RES policies had a difficult starting position from an economic point of view – first as regards the caveats from many neoclassical economists who contend that emissions trading is the only justified, externality-based intervention into electricity production (cf. Fankhauser et al. 2011), second as regards the high costs of novel technologies far from being competitive on established electricity markets.

Backwardness as a political advantage

As it turned out, however, it was the very initial backwardness of RES in economic and lobbying terms that became an advantage in the political arena. RES were underestimated as harmless niche technologies, which could not realistically hope to contribute significantly to electricity supply in industrialized countries[2] that are not blessed with some particular RES potential from a geographical perspective (such as Norway's hydro power potential). Thus, the introduction of the first RES support policy in Germany in 1991 might be understood as a primarily symbolic act: RES policies were welcome in that they communicated environmental concern, both towards the growing domestic environmental movement and green electorate (the Green party had entered the German parliament for the first time in 1983) and the international arena (UN Summit on Sustainability in Rio de Janeiro 1992). In the beginning, such a negligent treatment of RES appeared justified since RES shares remained low and had only negligible effects on electricity markets in terms of power price increase during the 1990s. Moreover, the incumbent utilities perceived RES support schemes as mostly harmless in comparison to stringent restrictions on emissions (Vossler 2014). For the same reason, RES policies were attractive from a political point of view: by posi-

[2] In a now-famous ad placed in several newspapers German utilities claimed in 1993 that, even in the long run, RES could not provide more than 4% of overall electricity supply (German utilities 1993).

tively supporting RES (and thus bringing spending power to the benefitting sectors at public burden) rather than taxing fossil resources (and thus cutting rents for powerful pressure groups), legislators could circumvent the opposition of well-organized conventional industry groups.

Furthermore, the German economy takes pride in its long tradition of engineering (cf. Radkau 2008) and technological development. This provided fertile ground for policies that could be interpreted as extending the trademark "Made in Germany"[3] to another area of cutting-edge industrial production – and corresponding rents on international technology markets. In particular, economic challenges of the reunification for Eastern Germany called for regional industrial policies. So in a way RES support seemed to serve all interests well.

Crucially, the extension of the RES support scheme in 2000 contributed to relative price changes (for PV generation costs have been reduced by more than 20% with each doubling of installed capacity in the past two decades, see, e.g., IRENA (2012)) that structurally altered the electricity sector more than most people had expected. In particular, the fossil-nuclear electricity monopoly realized too late the significant threat which RES policies posed for their dominant position.

Creation of renewables constituencies

As a consequence of the effective RES support scheme (cf. Section 3.3 for a detailed analysis of specific instrument design), the share of gross electricity consumption generated by RES increased from 7% in 2000 to 27.8% in 2014 (BDEW 2015: 15). In other words, the share of RES quadrupled in roughly one and a half decades. Importantly, RES production capacities are predominantly owned by new players: in 2012 (Trendresearch, 2013), 35% of all RES installations were owned by private persons, 11% by farmers, 14% by project managers, 13% by banks and funds, and 14% by businesses. In contrast, the "big four" had only reluctantly invested in RES and owned only 5% of RES installations. Thus, the rising share of RES directly reduced the big four's market shares. Moreover, there are technology-specific effects of RES deployment that compromise the conventional utilities' profitability: The so-called "merit order effect" – increased photovoltaic (PV) feed-in around peak-load times crowds out conventional peak power plants – leads to decreasing profits for the conventional utilities. For instance, current expansion trajectories for German PV imply that conventional plants have to cope with dramatically lower contribution margins: the proportion of sales contributing to cover fixed costs is expected to decrease by more than 25% for existing coal-power plants and more than 30% for new gas plants (Bode and Groscurth, 2011: 105).

In theory, this reduction of rents for incumbent power generator should have led to more opposition against (the continuation of) RES support schemes. However, the economic and technological structural change towards more decentralized, small-scale energy production also reduced the fossil-nuclear oligopoly's political leverage. In formal terms, one might interpret the firm establishment of RES-interests on the political agenda as a non-linear regime shift/equilibrium switch

[3] Compare the slogan "Vorsprung durch Technik", internationally used by one German car manufacturer - making its point by *not* translating the slogan.

due to positive feedbacks and self-stabilization processes (Müller 2015, Strunz 2014). More specifically, the traditional conservative support for fossil-nuclear interests was eroded by bottom-up support for RES within conservative constituencies (Strunz 2014). RES policies distribute sizeable rents, thereby creating a large number of beneficiaries, particularly in traditionally conservative areas in Southern Germany that are well suited for PV installations. For instance, the region of Lower Bavaria in 2011 received a net surplus of almost 450 million Euro through PV-remunerations (Growitsch et al. 2015: 82).

Renewable policy as a part of mainstream politics

Along with the rapid increase of RES deployment, the *Energiewende* narrative of almost full RES-supply by 2050 – originating from the left-alternative fringe of German politics – percolated the whole political spectrum. Important steps in this development were taken by the conservative coalition under Chancellor Merkel, first in 2010, when it adopted an energy concept aiming at over 80% RES supply by 2050 (while reasserting the necessity of nuclear power as a "bridging technology") and subsequently in 2011, when the Fukushima disaster lead to Merkel's decision of phasing out nuclear power by 2022 – possibly because she feared that the disaster had altered the median voter's preferences as to the use of nuclear power.

Meanwhile, the RES industry established itself – both in geographic terms as regional industrial hotspots, and in political terms as an agenda setter. For instance, around Bitterfeld, a town in Eastern Germany, the so-called "solar valley" with considerable production facilities for PV cells emerged. As a result, the RES industry's vested interests are increasingly powerful: First, the RES industry can claim that any weakening of RES policies would endanger green jobs and threaten the overall reputation of Germany as a technological frontrunner and nation of engineers. Second, vested interests may be framed via the common good *Energiewende*. As described above, the overall vision of the *Energiewende* has conquered the mainstream of German politics and the question *if* it is possible and desirable to rebuild electricity supply purely on RES has been displaced by specific questions *how* to achieve that goal. Hence, political entrepreneurs in Germany highly have to fear reputational loss in case of being blamed for a failure of the *Energiewende*. For instance, opposition to altered RES-support regulations is regularly marketed as a warning for politicians not to "choke" the transition process (BEE 2013, see also Section 3.3).

Besides national politicians and interest groups there are additional players influencing national RES policies: the EU Commission and the German states (*Bundesländer*). The Commission currently frames the overall European debate on the future of RES, thereby contributing to specific policy innovations in Germany (cf. Tews 2014). Since regional redistribution through RES remunerations is significant (cf. Growitsch et al. 2015), the *Bundesländer* aim at influencing the support scheme in their favor. In the following, the analysis investigates the characteristics of national RES-support within the multi-level governance system.

3.2 Fragmented RES policies

Energy policy: a European or a national matter?

In a way, the question who may distribute energy-related rents is at the heart of the European integration project. The *European Coal and Steel Community*, the forerunner of the EU, was founded in 1951 so as to prevent future conflicts between Germany and its Western neighbors. This main objective has been fully accomplished. European integration has advanced to a degree where the important energy-related cleavage lies between the supranational institutions (Commission and Parliament) one the one hand and national governments and bureaucracies on the other hand: who possesses discretionary decision-making power over energy policy?

In line with the presumptions of Public Choice theory, the EU Commission and EU Parliament aim at maximizing their influence by centralizing policy-making in Brussels/Strasbourg (see below). Sure enough, Member States would rather continue to allocate energy rents themselves than to have this lever transferred to the EU level. In particular, Member States' politicians are incentivized to reject the free allocation of energy production capacities around the EU in order to prevent potentially disruptive change in national industry structures and to serve domestic rent-seeking pressure groups (cf. Gawel et al. 2014b, Strunz et al. 2015).

The legal development mirrors this conflict of interest. While the Lisbon treaty, in force since 2009, for the first time grants the Commission explicit competencies in energy policy (Article 194 TFEU), indirect influence on the Member States has a longer tradition: Next to soft approaches such as persuasion, agenda setting and moderating national cooperation (cf. Callies and Hey 2013), the Commission's strongest weapons relate to the objective of a common market, which all Member States have committed themselves to establish (see below). In addition, environmental issues have been directly linked to the energy sector since the 1980s, for instance as regards harmonization of emission standards. Against this backdrop, the Member States have meticulously preserved their formal sovereignty over energy policy within the Lisbon treaty: Any measures taken by the EU "shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply" (Article 194(2) TFEU).

It is no wonder, then, that EU regulations such as the electricity market directive (2009/72/EC) or guidelines for state aid on environmental protection and energy (2014/C 200/01), increasingly collide with Member States' RES policies. For instance, in 2014 the EU Commission opened in-depth proceedings to investigate whether specific provisions of Germany's RES Act (see also Section 3.3) distort competition and trade between Member States. Leaving legal considerations on the correctness of these charges aside (cf. von Unger 2014), they reveal a struggle over influence and competences (cf. Gawel and Strunz 2014; Marr 2014): Since the EU Commission has no European RES instrument at its disposal, the Commission's strategy consists of steering Member States' policies and eliminating possible obstacles towards the common market. Thus, the RES directive (2009/28/EC) obliged all Member States to devise national action plans to ac-

cord with the overall 20-20-20 goals of EU climate and energy policy. Recent guidelines for state aid on environmental protection and energy (2014/C 200/01) demonstrate how the Commission aims to align national policies on a very specific policy pathway (i.e., tender schemes as the only legitimate form of RES support). In fact, the genesis of previous RES directives has been interpreted as failed attempts of the Commission to make all Member States adopting specific RES policies (Jacobs 2012: 25ff.). Furthermore, potential economic benefits of harmonized approaches on RES deployment on a European level (e.g., Unteutsch and Lindenberger 2014) are a welcome argument for "Europeanizing" energy policy (Gawel et al. 2014b, Strunz et al. 2015).

In general, the conflict of interest might be summarized as follows: the EU Commission desires a polished image of Europe as an international forerunner in climate and energy policy, where main competences are situated with Brussels and Strasbourg. National bureaucracies and politicians, however, oppose any sovereignty transfer in this respect: not only would they lose direct decision making power, but also are they wary of the expected consequences of rigorous "Europeanization" of ambitious climate and energy policy: production-cost based allocation of energy infrastructure around the EU, regardless of any national considerations, would entail a major redistribution of rents (e.g., relocation of solar power from Central to Southern Europe, accelerated dismantling of coal power in Eastern Europe). So, beyond the mere ability to decide, decision-making power over energy policy is coveted as discretion over rents.

Fragmentation within the Member States

The same motives that keep RES policies fragmented across EU Member States yield incentives for sub-national fragmentation. In other words, the conflict of interest about discretionary distribution of rents replicates itself on lower levels. The difference, of course, consists in the national administrations disposing of the most important legislative powers; consequently, instead of explicit struggles about competences, conflicts, therefore, might manifest in more implicit ways. In the following, the example of Germany's federally organized polity provides some insights on how sub-national jurisdictions try to maximize their influence (in more centralized polities such as France, there might exist comparatively less leeway to do so).

The German states, the *Bundesländer*, have a traditionally strong standing. As regards the distribution of competences between federal and state level, a functional differentiation has been observed (von Beyme 2010). That is, while the federal level possesses crucial legislative competences, the states have considerable administrative and budgetary powers. Although RES policies are devised and implemented on a federal level, the states exert their influence in several ways: First, the *Bundesrat*, the second legislative chamber on national level, directly contributes to the legislative process. Second, planning law on state and communal level crucially affects the spatial allocation of RES-related infrastructure especially for wind power. Third, the *Bundesländer* as well as municipalities may set up individual RES targets and policies, in addition to the federal ones.

The first point, states' influence on the federal legislative process, became very clear during the 2014 reform of the RES Act. In Germany, RES deployment has created a clear regional pattern leading to obvious regional interests of all states to protect "their" particular RES technology. Hardly surprising, the RES Act reform in 2014 in general had been delayed by the *Länder*, and northern opposition against tight caps on onshore wind power expansion (the economic repercussions of which would primarily be borne by industries in Northern Germany[4]) as well as Bavarian opposition against cutting biogas remunerations could be observed. These states' interests made their clear imprint on the final version of the law (Gawel 2014, Gawel and Lehmann 2014). In other words, some *Länder* tried to reap the regional benefits of RES deployment while free-riding on RES subsidies paid for by all German electricity consumers (Gawel and Korte 2015).

The second issue is best illustrated by the states' prime ministers attempts to increase popularity with their constituencies – regardless of their parties' national allegiances or even in explicit emphasis of their putting regional over national interests. For instance, the Bavarian prime minister in 2014 initiated a strong administrative restriction to the installation of new wind turbines and questioned the necessity of (previously agreed upon) transmission lines from Northern to Southern Germany. Both initiatives were barely (if at all) concealed efforts to capitalize on local NIMBY-protests against new wind parks or new transmission lines (cf. Hecking 2015).

The third issue relates to municipal and state-level plans for an "energy transition from below". Electricity cooperatives and plans for regional autarky would foster the decentralization of the overall transition process (Tews 2014). By transforming consumers into *pro*sumers (either through RES-production on household-scale or by participating in local cooperatives), rents would increasingly be redirected towards individuals. This "thousand flowers" vision of climate and energy policy (cf. Foxon 2013) creates, in practice, new politico-economic problems (Gawel and Korte 2015): for instance, complete electricity-autarky may often not be economically sensible but since access to the grid is a 0/1 issue, any "part-time reliance on the grid" would raise the issue of free-riding on systemic services. Furthermore, regional and state expansion targets do not match and there is no overall coordination of small-scale initiatives (the sixteen RES targets of the *Bundesländer* add up to a higher number than the federal expansion target, see also Ohlhorst 2015). In consequence, fragmented local or state activities may not be desirable from a systemic perspective.

3.3 Explaining the specific design of RES instruments

Having addressed the establishment of RES policies as well as their persistently fragmented position within the EU's system of multilevel governance, we now turn to more specific issues of instrument design and development. The concrete implementation of RES policies, compounded by the continuous need to adapt policies to novel challenges – also termed "compulsive policy-

[4] Two of the top three suppliers of wind turbines for the German market are situated in Northern Germany (Enercon in Aurich, Senvion in Hamburg), the third is located in Denmark (Vestas).

making" (Hoppmann et al. 2014), involves repeated choices: e.g., which degree of exposure to market risks? which remuneration mechanism? which degree of technology differentiation? and so on. In the following, we will give an overview on the EU but again focus on the German example.

Basic design options for RES support instruments

In 2014, of the 28 EU Member States 17 had adopted a feed-in tariff, 10 a feed-in premium, 6 a quota scheme and 3 a tender scheme (res-legal.eu). In other words, some Member States had adopted a hybrid of several support instruments. The development over time shows three clear trends (Kitzing et al. 2012): while the number of feed-in tariffs peaked in 2010, the number of feed-in premiums is continuously increasing and the number of quota schemes has been stagnating since 2005. From a public choice perspective these trends align well with changing constellations regarding the perceived public importance of issues. In the beginning, RES were "harmless" niche technologies (cf. Section 3.1) that seemed to deserve very generous support without thereby endangering fossil-nuclear dominance or affecting power consumption by significant price increases. A combination of guaranteed tariffs and prioritized feed-in (as well as a surcharge-based financing – see below), that was adopted in most Member States, therefore, implied a most convenient support scheme. Yet, as Müller (2015: 116 ff.) argues, feed-in tariffs have regularly overestimated production costs of RES, thereby giving rise to self-reinforcing dynamics to the detriment of conventional electricity inducing further cost reductions. As a result, RES could no longer credibly claim to be niche technologies and power price impacts could no longer be neglected. Against this background, an ongoing debate on market and system integration of RES has come up (e.g., Kopp et al. 2012, Winkler and Altmann 2012). The EU Commission has seized this opportunity to cover up their interest in becoming a genuine energy policy player by referring to the principles of the single market and the advantages of EU-wide competition and market integration of RES. For instance, the EU Commission's latest state aid guidelines (2014/C 200/01) aim at increasing the market pressure on RES and lead Member States away from feed-in tariffs towards premium schemes and tenders. Thus, the recent introduction of "prototype PV tenders" in Germany fits this trend.

At the same time, there is another basic feature of RES policies, which the beneficiaries have, so far, defended rather successfully: an elevated degree of technology differentiation caters to the diverse vested interests of industries and regions. For instance, in 2011 there were 128.000 jobs within Germany's PV industry (BSW Solar, cited in Hoppmann et al. 2014: 1430); a technology neutral RES scheme would benefit only the least costly RES, that is, onshore wind power, and the regions where respective plants are situated. So in order not to further curb all other industries and regions a continued reliance on technology differentiation seems likely and is, up to now, inherent part of German RES policy.

Cost and financing aspects of RES support

Financing of RES support policies is a natural leverage point for lobbying from all stakeholders. Accordingly, politicians aim to distribute costs in a way that minimizes stakeholder protest. Most convenient in this respect seems financing RES support through general tax systems (in favor of this model: Grösche and Schröder 2015) as this enables "hiding" the costs of RES within federal budgets.[5] However, this pathway is clearly ruled out by EU state aid regulations, as repeated legal disputes demonstrate (cf. Gawel and Strunz 2014). In consequence, RES support schemes in the EU are funded through levies on retail electricity prices.

The specific regulations of Germany's RES Act nicely illustrate how lobbying from interest groups affect the actual design of such RES levies. Well-organized interest groups of the energy-intensive industry succeeded in effectively shifting the financial burden to less organized electricity consumers, that is, households and small businesses. The official narrative reads that those branches of industry which are exposed to highly competitive international markets should be allowed to pay reduced RES-levies. In practice, energy-intensive industries are granted very generous exemptions, which cannot be meaningfully justified by "high exposure to international competition". Also, these exemptions increased over time, public discussions on the need to make eligibility criteria more restrictive notwithstanding (cf. Gawel and Klassert 2013). As a result, energy-intensive industries may even financially profit from RES deployment: the merit-order effect yields decreasing spot market prices for electricity due to increased RES supply – particularly during (previously) peak price times. Now some energy-intensive industries find themselves in the comfortable position of paying sharply reduced RES levies while benefitting from the merit-order effect – by some estimates, the financial windfall amounts to several hundred million € per year (Küchler and Reuster 2012). In principle, all consumers might gain from increased RES feed-in: as Hirth and Ueckerdt (2013) demonstrate, subsidized deployment of RES yields a sizeable consumer surplus if costs are evenly borne by all consumers. However, the German example shows how well-organized interest groups may redirect rents onto their balance sheets.

Against the background of rising retail electricity prices, unexpected actors have recently displayed concern for the social repercussions of the energy transition (Gawel et al. 2015). For instance, a think tank, which is financed by the association of electronic and metal industries, has strongly attacked German RES expenses with reference to their social impacts (INSM 2012). Curiously, the same think tank is an outspoken critic of other regulations that aim to redistribute wealth towards low-income groups (e.g., minimum wage, capital and estate taxes)[6].

[5] A more explicit variant of concealing the costs of RES policies would be to defer them into the future by debt-financing RES deployment. For instance, some German politicians proposed that all old contractual RES-remuneration obligations be transferred into a fund, to be partly covered by debts. However, this proposal met sharp public critique and has not been implemented (Gawel and Lehmann 2014).

[6] http://www.insm.de/insm/ueber-die-insm/FAQ.html

Germany's RES Act: status quo and recent discussions

The latest version of the German RES Act, including accompanying commentary on how to interpret detailed provisions, can amount to 1728 pages (see e.g., Salje 2014). To describe the industries' and track railways' privileges with respect to the RES surcharge on power retail prices the German legislator was in need of 494 words (2003 when first introduced to German law), 991 words (2012) up to 2388 words in 2014. The degree of differentiation has reached a level where virtually all aspects of RES support are sub-divided into completely different categories. Slight glimpses into the complex schemes for financing the RES subsidies and differentiation according to technologies have already been provided. What is more, the label "feed-in tariff" is, at a closer look, partly misleading. Not only are there several intricate degression schedules following spatial and temporal considerations (i.e., specified reductions of the support level), but also do wholly different mechanisms by now complement (or even supersede) the feed-in tariff: premium schemes and prototypes of tendering procedures (Gawel and Purkus 2014; Purkus et al. 2015). A more detailed exposition of the regulations would be far beyond the scope of this paper – and this very fact constitutes strong evidence in favor of our main argument here: *a complex regulatory framework caters to the heterogeneous interests involved in the processes of policy formulation and implementation*. For it enables targeted rent distribution by politicians. Such a targeted distribution of rents, in turn, benefits a wider range of interest groups; also, bureaucrats benefit from an ever more complex law that requires administrative implementation, monitoring and reporting back to politicians. The buck stops with unorganized electricity consumers who have to bear the main financial burden.

Unfortunately, complex regulations to the benefit of a range of vested interests may give rise to lock-in effects: political adaptive capacity diminishes because systemic needs – such as market integration of RES – collide with the rent-seeking behavior of RES-beneficiaries. For the latter, it is tempting to frame even small policy adjustments as a danger to the overall *Energiewende* project. In this vein, recent reforms of the RES Act have been decried as "choking" the deployment of RES (e.g., BEE 2013). Although the latest reform was boldly promoted as RES Act "2.0" (Gabriel 2014), it hardly lived up to this label (Gawel 2014, Gawel and Lehmann 2014). From this paper's perspective, this was to be expected since legislative output reflects a compromise only – the lowest common denominator to a diverse set of interests and to comply with allegedly strict European state aid law.

4. Discussion

By now, Germany's energy transition enjoys broad popular consent and a large field of RES beneficiaries has emerged. From a Public Choice perspective, the *Energiewende* narrative reflects a mix of ideology and rent-seeking – it partly results from solidified vested interests. The political consequence of accordingly shifting political power balances are altered decision-making routines that favor RES over conventional electricity. On the one hand, this accelerates the transition

process in the short term by rapidly increasing the deployment of RES. On the other hand, the long-term transition project implies the challenge of making RES completely independent from government support. The danger, then, is a lock-in into particular RES policies and technologies that, while effective in the short run, turn out to be inefficient in the long run in the sense that the upcoming effort to fully integrate RES into power markets and to let them also assume responsibility for power system stability could be hindered by institutional path dependencies provided by policies seeking to serve influential societal interests rather than providing a framework for sustainable power supply at least cost

What lessons does the above analysis provide for political adaptive capacity – how can lock-in effects be actively prevented? Unfortunately, there is no "premium of simplicity" (Helm 2010: 194). The one "robust" policy, immune to lobbying efforts and based on principles of pure economic rationality, remains elusive. The EU Emissions Trading Scheme provides striking examples of how vested interests succeed in manipulating even rule-based regulation in their favor by lobbying for and taking advantage of loopholes within the regulatory framework (cf. Spash 2010). In this paper's context this implies that efficiency-oriented calls for a technology-neutral, market-derived or at least uniform RES premium, harmonized on EU-level, are, most likely, futile.

Given this diagnosis, is there any ground for not despairing in the face of cumulative lobbying efforts? Paradoxically, the very mechanism of interest group competition might give rise to a glimpse of hope. For continuous competition of heterogeneous interests is nothing else than a system of checks and balances. Inefficient policies are under constant justification pressure and cases of obvious regulatory capture will meet harsh protests of disadvantaged interest groups. The condition, of course, is a pluralist system of democratic decision making that offers substantial degrees of transparency and openness to new entrants (both politically and economically). The only criteria of success (in terms of rent-appropriation) then are organizational skill and credible supporting narratives. Two examples from the above analysis underline this argument. First, the emergence of RES in the EU has proven that niche actors may develop into equal peers next to incumbent actors. Second, the debate on costs of the energy transition implies that pluralism may keep regulatory capture and rent appropriation in check.

In sum, this paper has provided a theoretical explanation for the astonishing success of RES policies in Europe. Underestimated in the beginning, RES policies continuously improved RES' position relative to conventional energies – with structural consequences both in economic and political terms. In Germany, this shift might be even more pronounced than in other EU Member States. As a result, the overall ideological frame of the energy transition now draws strong support from RES-beneficiaries – who, at the same time, may hide their vested interests under that umbrella. The challenging task for policy makers will be to balance all these interests without compromising the efficient long-term transition pathway.

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